

3239-01

We claim

1. **(Currently Amended)** A multiple water-in-oil-in-water emulsion composition comprising:

(1) a discontinuous phase, wherein that discontinuous phase comprises a) a water discontinuous phase, b) an oil continuous phase, c) an emulsifier selected from the group consisting of a polyisobutenyl succinic anhydride-derived emulsifier(s), a polyisobutene derived emulsifier(s) and mixtures thereof, d) optionally a co-emulsifier and e) optionally thickeners for the discontinuous phase resulting in an internal water-in-oil emulsion; and

(2) a continuous phase, wherein that continuous phase is an external aqueous phase comprising a) water b) the internal water-in-oil emulsion, c) an oil-in-water emulsifier and c) optionally thickeners for the external aqueous phase; and

wherein the emulsifier is used in the range of about 0.1 wt.% to about 30 wt.% of the final multiple emulsion; and

wherein the water phase of the internal water-in-oil emulsion is comprised of droplets having a mean diameter of about 0.1 to about 5 microns;

resulting in a stable water-in-oil-in-water multiple emulsion.2

2. **(Original)** The composition of claim 1 wherein the polyisobutenyl succinic anhydride-derived emulsifier comprises the reaction product of poly(isobutylene) with maleic anhydride, poly(isobutylene) succinic anhydride, poly(isobutylene) succinic anhydride derivatives, functionalized poly(isobutylene) succinic anhydride, the reaction product of poly(isobutylene) succinic anhydride with alcohol, amines, polyols, polyamines, and alkanolamines, the reaction product of poly(isobutylene) succinic anhydride with triethanolamine, the reaction product of poly(isobutylene) succinic anhydride with glycerol, the reaction product of

poly(isobutylene) succinic anhydride with sodium hydroxide, or combinations thereof.

3. **(Currently Amended)** The composition of claim 1 wherein the polyisobutylene derived emulsifier is selected from the group consisting of at least one of the following: comprises polyisobutenyl substituted phenols, amino polyisobutenyl phenols, polyisobutenyl amine and mixtures thereof;[.] the reaction products of polyisobutylene with  $\alpha,\beta$ -unsaturated olefins followed by further functionalized by reaction with nucleophiles like water, alcohol, polyols, amines, polyamines, alkanolamines, and inorganic bases; the reaction products of polyisobutylene with glyoxylic acid, lower alkyl glyoxylates, such as methyl glyoxylate, or lower alkyl hemiacetals, such acid methyl glyoxylate methyl hemiacetal, followed by further functionalized with primary or secondary amines, primary or secondary alkanolamines, or polyamines.

4-6. **(Canceled)**

7. **(Original)** The composition of claim 1 wherein the coemulsifier comprises sorbitan monooleate, sorbitan monoisostearate, glycerol monooleate, oleyl alcohol 2-ethoxylate, lecithin, sorbitan monolaurate, sorbitan monopalmitate, sorbitan monostearate, sorbitan sesquisterate, sorbitan trioleate, stearyl alcohol 2-ethoxylate, glycerol monostearate, sorbitan dioleate, wool fat, methyl glucoside dioleate, polyglyceryl-3 diisostearate, polyethylene glycol 200 distearate, methyl glucose sesquisterate, polyethylene glycol 200 monostearate, alcohol alkoxylates, copolymers of various alkoxylates, alkyl amines or alcohols or amides, ethoxylated alkyl amines or amides, betaines, compatible sulfonates or sulfates or sulfosuccinates or phosphonates or borates or amine salts or carboxylates, or mixtures thereof and the coemulsifier is present in the range from about 0 wt.% to about 10 wt.% of the internal water-in-oil emulsion.

8. **(Currently amended)** The composition of claim 1 wherein the aqueous material comprises tap water, demineralized water, deionized water, floral water or combinations thereof; and  
wherein the oil comprises fatty substances, volatile oils, non-volatile oils or mixtures thereof; and  
wherein the external aqueous phase comprises tap water, demineralized water, deionized water, floral water or combinations thereof; and  
the water is present in the range of about 1 wt.% to about 99 wt.% of the internal phase of the water emulsion; and  
the oil is present in the range of about 99 wt.% to about 1 wt.% of the water-in-oil emulsion; and  
wherein the internal water-in-oil emulsion to the external aqueous phase is in the range of about 10 to 90:90 to 10.

9. **(Canceled)**

10. **(Canceled)**

11. **(Currently Amended)** The composition of claim 1 wherein the external aqueous phase emulsifier comprises ethoxylates, nonionic ethoxylated fatty acids, esters, sorbitan esters, alkylphenols sorbitan monolaurate, carboxylates, amine salts, metallic salts, alkylarylsulfonates, amine oxides, poly(oxyalkylene) compounds, including block copolymers comprising alkylene oxide repeat units, carboxylated alcohol ethoxylates, ethoxylated alcohols, ethoxylated alkylphenols, ethoxylated amines and amides, ethoxylated fatty acids, ethoxylated fatty esters and oils, fatty esters, fatty acid amides, including but not limited to amides from tall oil fatty acids and polyamides, ethoxylated glycerol esters, ethoxylated glycol esters, ethoxylated sorbitan esters, imidazoline derivatives, lecithin and derivatives, lignin and derivatives, monoglycerides and derivatives, olefin sulfonates, phosphate esters and derivatives, propoxylated and ethoxylated fatty acids or alcohols or alkylphenols, sorbitan derivatives, sucrose esters and

derivatives, sulfates or alcohols or ethoxylated alcohols or fatty esters, sulfonates of dodecyl and tridecyl benzenes or condensed naphthalenes or petroleum, sulfosuccinates and derivatives, and tridecyl and dodecyl benzene sulfonic acids or mixtures thereof and is present in the range from about 0.01 wt.% to about 10 wt.% of the multiple emulsion; and

wherein the multiple emulsion is thickened by a thickener comprising xanthan gum, cellulose, chitosan, starches, silicates, magnesium aluminum silicates, hydroxyethylcellulose, xanthan gums, glucose-mannose polysaccharides, ammonium poly(acryldimethyltauramide-co-vinylformate), stearyl alcohol, cetyl alcohol, cetearyl alcohol, clays, hectorites, smectites, bentonites, crosslinked polyacrylic acid copolymer, modified crosslinked polyacrylate polymer, polyethoxylates of methyl glucose and their derivatives, PEG-120 methyl glucose dioleate, starch, modified potato starch, ethylene/propylene/styrene copolymers, butylenes/ethylene/styrene copolymers, polyisobutylene, hydrogenated polyisobutylene, waxes, polyethylene wax, beeswax, oil soluble polyacrylates, oil soluble polymethacrylates, olefin polymers, olefin co-polymers, functionalized olefin copolymers, olefin terpolymers, functionalized olefin terpolymers, hydrophobically modified clays, silicas, and copolymers of styrene and olefins or the mixtures thereof and wherein the thickener is in the range from about 0 wt.% to about 10 wt.% of the multiple emulsion; and

wherein the composition comprises water soluble additives comprising propylene glycol, active agents, preservatives, antioxidants, complexing agents, perfumes, fillers, bactericides, odor absorbers, color matter, dyes, lipid vesicles, protein hydrolysates and polyols such as glycerin; glycols such as polyethylene glycols; sugar derivatives; natural extracts; skin lightening agents, bleaching agents, botanicals, refatting agents, skin and hair conditioners; vitamins, urea; caffeine; depigmenting agents such as kojic acid and caffeic acid; beta-hydroxy acids such as salicylic acid and its derivatives; alpha-hydroxy acids such as lactic acid and glycolic acid; emollients and humectants, such as ethoxylated methyl glucosides and acylated ethoxylated methyl glucosides; dihydroxyacetone,

amino acids and mixture of amino acids, inorganic salts, inorganic oxides, sunscreens, retinoids such as retinol and its derivatives and carotenoids; organic and inorganic screening agents; hydrocortisone; DHEA; melatonin; algal, fungal, plant, yeast or bacterial extracts; proteins, hydrolysed, partially hydrolysed or unhydrolyzed; enzymes or mixtures thereof and wherein the water soluble additives are in the range from about 0 wt.% to about 30% of the multiple emulsion; and

wherein the composition comprises water dispersable additives comprising clays, pigments, aluminum oxides, silicates, talc, magnesium silicates, titanium dioxide, zinc oxide or mixtures thereof and wherein the water dispersable additives are in the range from about 0 wt.% to about 30 wt.% of the multiple emulsion; and

wherein the oil composition comprises oil phase additives comprising lipophilic additives, fatty acids, fatty alcohols, gums, waxes, silicone gums, oil gelling agents, organic particles, inorganic particles, thickeners, vitamins, organic sunblocks, avobenzone, octocrylene, cinnamate esters, salicylate esters, refatting agents, skin conditioners, hair conditioners, emollients, moisturizers, lanolins or mixtures thereof and wherein the oil phase additives are in the range from about 0 wt.% to 30 wt.% of the internal phase of the water-in-oil emulsion.

12-16. ***(Canceled)***

17. **(Original)** The composition of claim 1 wherein the internal water-in-oil emulsion in the external aqueous phase is comprised of droplets of the internal water-in-oil emulsion having a mean diameter of about 1 to about 50 microns.

18. **(Original)** The composition of claim 1 wherein the oil-in-water emulsifier has an HLB of about 8 to about 20.

19. **(Original)** The composition of claim 1 used as multiple emulsion for products selected from the group consisting of industrial products, household products, consumer products, personal care products, metal working products, horticulture products, agriculture products, coating products, paint products, ink products, lubricant products, fuel products and combinations thereof.

20. **(Original)** A method of making a multiple emulsion composition comprising combining an aqueous component in the range of about 1 wt.% to about 99 wt.% and an oil phase in the range of about 99 wt.% to 1 wt.% with an emulsifier selected from the group consisting of poly(isobutylentyl) succinic anhydride-derived emulsifier, a polyisobutylene derived emulsifier and mixtures thereof to produce an internal water-in-oil emulsion, and then combining the internal water-in-oil in an external aqueous phase at a ratio of 10 to 90:90 to 10 with an emulsifier with a HLB of 8 to 20 resulting in a stable multiple emulsion.